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TECHNICAL MEMORANDUM

Utah Coal Regulatory Program

October 28, 2008

TO: Internal File

THRU: Steve Christensen, Team Lead SKC

FROM: Priscilla W. Burton, CPSSc, Environmental Scientist III PWB 10/28/08

RE: Degassification Volume -- Add Well G-22 and access road, Canyon Fuel Company, Dugout Canyon Mine, C/007/0039, Task ID #3068

SUMMARY:

Attachment 2-1 of the **Methane Degassification Volume** of the MRP contains baseline survey information gathered from well sites. The G-22 well and access road were surveyed in November 2007. This site is located northeast of the Pace Canyon Fan Portal in Sec 18 of T13 S., R.13 E (Table 1.1, Figure 1-1, and Plate 1-4), on Thayn Trust lands (Plate 1-1). The proposed road access to G-22 will follow the contour of the mountain slope. This slope has a rise of 126 ft. in a run 150 ft horizontal or 1.2h:1v. The G-22 pad location is on a small knoll on the mid-mountain slope in a south facing bowl at an elevation of 8,050 ft. At the pad location, the slope is shown on Fig 1 of Attach. 5-1 as running 265 ft.and rising 110 ft. or 2.4h:1v.

With this amendment, the total disturbed acreage for all degas wells is 49 acres. This figure includes the 14-acre AMV road and topsoil stockpiles along the road. The total disturbed area associated with the mine is 101.1 acres.

The Dugout Reclamation Agreement provides a bond for 79.3 acres. The MRP itemizes 97.6 disturbed acres, increasing to 101.1 acres with this application (Chap 1, pg 1-9 and in App. 1-4).

The application is recommended for approval. **Along with a conditional approval letter (for clean copies), the Division should request that Canyon Fuels Co. file an Exhibit D (revision to the reclamation agreement) for the change in the disturbed area at the Dugout Mine and a revised Exhibit A (legal description of disturbed area) to reflect current information listed in Chap 1, pg 1-9 and in App. 1-4.**

TECHNICAL ANALYSIS:

GENERAL CONTENTS

RIGHT OF ENTRY

Regulatory Reference: 30 CFR 778.15; R645-301-114

Analysis:

Right of Entry to the surface lands is provided by federal coal lease U-07064-027821, dated January 1, 1957 (MRP Section 114 and Appendix 1-1).

The Surface Owner Agreement between the Thayn Trust and Canyon Fuel Company is included in Appendix 4-2 of the MRP. The agreement will expire in 2019. [09122007]

Findings:

The information provided meets the Right of Entry requirements.

ENVIRONMENTAL RESOURCE INFORMATION

Regulatory Reference: Pub. L 95-87 Sections 507(b), 508(a), and 516(b); 30 CFR 783., et. al.

PERMIT AREA

Regulatory Requirements: 30 CFR 783.12; R645-301-521.

Analysis:

With this amendment, the total disturbed acreage for all degas wells is 49 acres. This figure includes the 15 acre AMV road and topsoil stockpiles along the road.

The total disturbed acreage for the mine is recorded as 101.1 acres. For the disturbed acreage listed for gas wells, roads, refuse pile etc, see Chapter 1 page 1-9 and Appendix 1-4. Appendix 1-4 provides a legal description of the disturbed area and disturbed acreage. This description was updated with this application.

Findings:

Information provided meets the reporting requirements.

SOILS RESOURCE INFORMATION

Regulatory Reference: 30 CFR 783.21; 30 CFR 817.22; 30 CFR 817.200(c); 30 CFR 823; R645-301-220; R645-301-411.

Analysis:

Appendix 2-2, Volume 1 of the MRP provides a general outlook on the soils of the Book Cliffs in the vicinity of the Dugout Mine. Figure 1-1 and Plate 1-4 (**Methane Degassification Amendment Volume**) shows the location of the degas wells. Table 1-1 provides locations of the wells and Table 1-2 states each well's acreage. With this amendment, the total disturbed acreage for all disturbance associated with the degas wells is 49 acres (MRP Chap 1, p. 1-9). [10272008]

The specific soils information for degasification well sites G-2 through G-19, and G-22 and G-31 is found in Attachment 2-1 (**Methane Degasification Amendment**) of the MRP. (Sites G-1 and G-8 were not developed.)

Baseline soil chemistry information for soils at sites G-2 through G-7 was collected at the time of disturbance (Attachment 2-1), all subsequent sites were surveyed and soil analyzed prior to disturbance. The following parameters were analyzed: texture (particle size analysis), pH, Electrical Conductivity, Sodium Adsorption Ratio, percent $CaCO_3$, plant available Nitrogen, Potassium, and Phosphorus (Section 243). Soil sample analyses are found in Attachment 2-1.

The sites are located at approximately 7,400 to 8,900 ft (see Fig 1-1 and Plate 1.4). The site descriptions, drawings, and photographs are in Attachment 2-1. Some of the sites were previously disturbed by logging (Table 3-1, pg 3-16, Attachment 2-1 section 4.3), previous exploration or road construction (sites G-6, G-9, G-11, G-12, G-14, G-15, G-16, G-17, G-19).

Degas site G-22 is an undisturbed site at 8,050 ft. elevation. The site and access road is represented by soil pits SP-10, SP11 and SP-12 in Ryan Sweetwood's soil survey, November 2007. His credentials are attached to the survey. The survey indcates that the topsoil or A horizon is less than six inches, and by rule R645-301-232.300, the A and B horizons will be salvaged together. (A ten inch salvage depth is anticipated.)

Soil profile descriptions are provided in Appendix A. It appears that field texture was not reported, since the profile descriptions listed on the soil profile sheets report the information collected by the laboratory for texture, including the notation "nd" for "not detected". Ordinarily

texture is assessed in the field and reported on the field profile sheets and the original field sheets are provided in the survey. Original field sheets are requested with all future surveys.

Appendix C contains the original laboratory reports from Intermountain Labs – Sheridan WY. Laboratory information for horizon B2 at site SP11 is missing on the original lab reports.

The 1988 Carbon County Soil Survey places the G-22 well location in Map Unit 97, Rotulee Family-Trag Complex. The soil survey site map for Site G-22 does not further elaborate on the extent soil series that were identified by the survey*: Rotulee Series (Entic Haplustolls); Stubbs Series (Pachic Argiborolls); and Beje Series (Lithic Argiborolls). The variety of series within such a short distance has been interesting to evaluate. All the series identified were in the soil Order of Mollisols. As such, the soils must all have a developed mollic epipedon, but the extent of development appeared dependent on slope and aspect. In most sample sites the mollic horizon was shallow, extending from 5 – 25 inches above an argillic (clay accumulating) horizon or bedrock.

[*The purpose of the soil site map is to provide the approximate boundaries of soil series that are identified by the reconnaissance survey. This was not done for site G-22, but must be accomplished by future soil surveys.]

Site descriptions, sketches, profiles, and soil analyses are in Attachment 2-1 for the degas well sites.

The 1988 Carbon County Soil Survey places the Rottulee family soil in the Mountain Very Steep Stony Loam range site with production of 1,300 lbs/ac in a favorable year.

Findings:

The information provided does not meet the requirements of the Regulations. See deficiency R645-301-222.

OPERATION PLAN

TOPSOIL AND SUBSOIL

Regulatory Reference: 30 CFR Sec. 817.22; R645-301-230.

Analysis:

Topsoil Removal and Storage

Sites G-8 through G-19 and G-31, and G-22:
[10282008]

Site configurations are provided in Attachment 5-1. Disturbed acreage for each well site is tallied in Table 1-2, with an additional 14 acres disturbed for road construction noted below Table 1-2. Topsoil salvage areas vary from 0.32 acres at site G-6 to 4.7 acres at site G-18 (Table 1-2). Topsoil salvage from 1.6 acres along the access road and pad is reported for site G-22 (App. 2-1, Att. 2-2 September 25, 2008).

Topsoil removal volumes are listed in Table 2-1 and Section 222.400 and Attachment 2-2. The salvage volume for access road and pad is 2,103 cu yds as listed in the Topsoil Volume Calculations Table of Attach. 2-2. The correct volumes were used in reclamation bonding, App. 5-6.

The proposed road access to G-22 will follow the contour of the mountain slope. This slope has a rise of 126 ft. in a run 150 ft horizontal or 1.2h:1v. This road will disturb a ribbon of land approximately 25 ft. wide. The G-22 pad location is on a small knoll on the mid-mountain slope in a south facing bowl at an elevation of 8,050 ft. The G-22 pad will disturb approximately one acre. At the pad location, the slope is shown running 265 ft.and rising 110 ft. or 2.4h:1v (Fig. 1, Attach. 5-1). A qualified person, familiar with the plan will be on site to direct the topsoil removal of from these small areas on steep slopes.

For site G-22 and access road, the topsoil stockpile dimensions are calculated in Attach 2-2 and reported in Table 2-2 as 85 ft. length X 65 ft. width X 12 ft high, with slopes of 2 h: 1v. A pile of this description has the capacity for 2,455 cu yds. The possible storage locations described in Section 231.100 as either pad G-17 or G-16, both are level pads. For the most effective erosion control protection through interim reclamation, the slopes will not exceed 2h:1v.

Erosion control methods for all stockpiles will include creation of stable slopes (ordinarily no steeper than 2h:1v), a berm around the base of the stockpile. This berm will be constructed of subsoil, but not excavated from around the topsoil stockpile. Surface gouging of the pile face and seeding with seed listed in Table 3-2 will be done to control erosion.

At some pad sites, stockpile slopes steeper than 2h:1v have been created temporarily. The steeper stockpile slopes allow for less disturbed area, but create difficult conditions for vegetation establishment. These steeper slopes are temporary and will be reduced during contemporaneous reclamation of the drilling pad sites. A projected date for contemporaneous reclamation of each sites is provided in the table in Attachment 5-2.

Subsoil will be excavated for use as berms and to create a mudpit at each site (Sec. 231.100, Methane Degassification Volume). But at the G-22 pad site, the depth to rock is 26 inches and the drilling mud will be transported via pipe to the existing mud pit at pad G-16 or may be hauled off site in a mobile unit to a waste disposal site, per Vicky Miller, 10/23/08.

Findings:

The information provided does meets the requirements of the Regulations.

RECLAMATION PLAN

TOPSOIL AND SUBSOIL

Regulatory Reference: 30 CFR Sec. 817.22; R645-301-240

Analysis:

This amendment makes no changes to the reclamation plan described for all the degas wells, as described below.

Degas Well Sites [07202007]

The reclamation timetable is shown on Figures 5-15 and 5-26. Unless otherwise specified, sites will be reclaimed in one phase after methane venting ceases. The well sites will be graded, topsoiled, roughened, seeded, and mulched (see Figures 5-4, 5-8, and 5-12). Topsoil replacement depth for each site is listed in Table 2-3. Delays in well plugging will occur as described in Sec.242.100.

The plan describes the reclamation of the drilling mud pits in Section 242.100. The mud pit will be allowed to dry and will be filled with soil that will be compacted to minimize settling. There will be mixing of the cover material with the rock fragments and sediments of the mud pit to avoid creating an abrupt boundary between the layers.

The plan indicates the sites will be ripped to a depth of eighteen to twenty four inches (Section 242.100 and 341.200) to reduce compaction.

Topsoil will be re-spread using a trackhoe. The soils will be handled when loose and friable (not too wet, not too dry), see Section 242.100. Redistribution thickness is shown in Table 2-3.

Section 542.100, Attachment 2-4 and Figure 5-26 indicates the weeks to completion from the start of reclamation activities. Reclamation of the AMV road will not take place until final reclamation of sites G-18 and G-31. Road base will be retained in the fill during reclamation (Attachment 5-4).

Soil Nutrients and Amendments

Soil nutrients and amendments will be applied to the redistributed soils based on analyses of samples collected from the stockpiled topsoil as compared with baseline information.

Soil Stabilization

Soil may be replaced at grades of up to 1.5h: lv (p. 5-70). The steepness of these slopes will be reduced at their base, providing a concave slope. Soil stabilization techniques also include ripping the subsoils (see p. 2-39), gouging all slopes 3H: 1V or greater after topsoil application (p. 2-40 and 5-76) and hydromulching the seeded surface (p. 2-41 and 3-44 and 3-50). Slopes which are 3h: lv or steeper will be gouged using a trackhoe (p. 5-70).

Findings:

The information meets the requirements of the Regulations.

RECOMMENDATIONS:

The application is recommended for approval. Future soil surveys must include the correct Munsell notation and field texture evaluation on the field description sheets.

The Dugout Reclamation Agreement provides a bond for 79.3 acres. The MRP itemizes 97.6 disturbed acres, increasing to 101.1 acres with this amendment (see figures listed in Chap 1, pg 1-9 and in App. 1-4). The approval should file an Exhibit D (revision to the reclamation agreement) for the change in the disturbed area on a revised Exhibit A (legal description of disturbed area).